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Navigating Challenges: Exploring Challenges to Occupational Diversification amongst the Farmers in Odisha

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ABSTRACT

Background: Growing uncertainties in farm-related endeavours have prompted concerns about the sustainability of farming communities, leading occupational diversification. Farmers were quite perceptive about the advantages of diversification yet they still fail to derive the benefits of it at the optimum extent in the form of the addition to the existing earning levels. That is why, this context pre-requisites of assessing the existing levels of occupational diversification and to determine the issues that ceasing the progress of farmers in the ventures of diversification.

Methods: The study was conducted in Khordha district of Odisha state under ex-post facto research design. A sample of 240 farmers was undertaken from eight villages through multi-stage random sampling procedure. Data collection conducted by personal interview with the use of pre-tested semi-structured questionnaires. Simpson's index of diversification for assessing occupational diversification along with Henry Garrett's ranking for grading the constraints faced by farmers were employed in the study.

Result: Majority (47.50%) of the farmers expressed moderate level in terms of extent of occupational diversification. The top ranked constraints under each dimension found to be- shortage of storage facilities (74.77) and marketing facilities (71.34) under infrastructural; absence of innovative technologies (73.55) and lack of market forecasting (70.11) under promotional; lack of proper education (72.23) and less experience on new ventures (70.79) under social; shortage of own resources (69.33) and rising fuel prices (65.33) under economic; erratic rainfall (70.77) and natural disturbances like floods, cyclones, *etc*. (64.46) under miscellaneous dimension. Therefore, the investigation recommends that the focusing on the solution-oriented approach towards the above-mentioned constraints for augmenting occupational diversification.

Key words: Activity, Constraints, Diversification, Livelihood, Occupation, Sustainability.

INTRODUCTION

As per the Odisha Economic Survey 2022-23, agriculture and its associated activities remain the primary occupation for a significant portion of Odisha's population, contributing substantially to the Gross State Value Added (GSVA) at 22.5 per cent (current prices) employing around 55.0 per cent of workforce in 2022-23. Analyzing sub-sectors' contributions to GSVA, crop cultivation holds the highest share at 14.2 per cent, followed by animal husbandry (3.0%), fisheries (2.7%) and forestry (2.6%). Out of 48.70 lakh farm holdings, 18.6 per cent of it are being operated by sharecroppers in which, 93.2 per cent of it comes from the sections of marginal and small farmers (Agricultural Census Division, 2020). Thus, it becomes gruelling task to elevate their existing income levels solely through increasing productivity, especially for staple crops like cereals owing to the associated risks and uncertainties of the conventional farming (Devi and Sharma, 2022). Therefore, despite considerable economic progress, Odisha is still categorized as one of the least developed states (Sahu and Panda, 2018), it has botched in magnification of both the private and public capital generation in state agriculture (Bathla and Aggarwal, 2022). Significant socio-economic disparities persist among different regions of the state (Sahoo and Paltasingh, 2019), exacerbated by natural calamities like cyclones and floods (Bahinipati and Venkatachalam, 2015; Jose and Ponnusamy, 2024), adversely affecting livelihoods and economic development. In response, communities have adopted various strategies for livelihood sustainability amidst such challenges and one of them is occupational diversification (Lakshman Reddy, 2019).

Occupational diversification involves rural households constructing a repertoire of activities and social support networks to enhance survival and elevate living standards (Ellis, 1998). This encompasses broadening economic

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bases to mitigate poverty risks and improve welfare (Barett *et al*., 2001). Such diversification patterns vary among farmer classes, with affluent households venturing into non-farming sectors, middle-income ones seeking casual labour or remaining within farming and subsistence-based crop production for others (Habib *et al*., 2022). Diversification decisions stem from either necessity or choice. Choice-driven diversification involves voluntary commitment to broaden income sources for accumulation rather than mere survival. Necessity-driven diversification arises from vulnerability, where households seek alternative livelihoods to sustain existence, potentially leaving them more vulnerable than before (Ellis, 2000). Rural households frequently experience both motivations concurrently, particularly during events like chronic illness affecting income earners, impacting poverty alleviation efforts ((Krishna, 2010). Diversification not only spreads risk (Fabozzi *et al*., 2010) but also provides a buffer against uncertainties (Witt and Waibel, 2011; Ray, 2022). Investing solely in activities with low success probabilities is impractical; instead, investing in activities with independent yields reduces overall volatility (Kemuma, 2014). Occupational diversification entails continually integrating new activities while maintaining or discontinuing older ones, resulting in a diverse portfolio. But it becomes of great importance regarding the diversification is of its suitability to the existing agro-climatic conditions of the region (Pillai and Radhakrishnan, 2023).

Agriculture in developing nations is fraught with various non-probabilistic risks and uncertainties (Akcaoz and Ozkan, 2005), encompassing climate-related factors like droughts and floods, price fluctuations, biological risks such as pests and diseases and financial challenges like access to credit and interest rate volatility (Thieken, 2016). Smallholder farmers, constituting a significant portion of rural society, often lack sufficient risk-bearing capacity. Despite farmers overseeing only parts of the production process, effective risk management at the farm level is imperative, as failure to do so can result in substantial income and livelihood losses in developing countries (Zulfiqar *et al*., 2016). Moreover, decision-makers throughout the agricultural supply chain encounter risks in their decision-making processes (Jones *et al*., 2012; Garrett *et al*., 2013). However, farmers in developing nations currently possess limited capacity to manage agricultural risks at the farm level (Akhtar *et al*., 2019). It's evident that embarking on new ventures such as occupational diversification will inevitably encounter obstacles and challenges. Therefore, prior attention of concern is needed to deal with such things by at first identifying their existence and analyzing its importance in terms of severity which can be defined as 'constraints to occupational diversification'. In the lieu of above mentioned, a comprehensive investigation was conducted to assess the prevailing extent of occupational diversification and to scrutinize the constraints faced by the farmers of Khordha district, Odisha, India in their path towards occupational diversification.

MATERIALS AND METHODS

The investigation was executed in the Khordha district of Odisha state in India as it has been purposively selected because of the diversity in activities of farmers in the region due to presence of the state's capital city of Bhubaneswar under the district boundaries and the rapid rise in demand of products and services for consumption specific to the requirements of demographic boom in the nearby cities. A detailed map of the state with the concerned district has been provided in the Fig 1. This can be validated by this point that as income levels increase, consumers tend to shift their preferences from basic food staples to higher-value food items. This change in consumer behavior encourages farmers to diversify their crop portfolios and prioritize the cultivation of high-value crops (Devi and Sharma, 2022). The sample was selected using a multistage sampling method, involving the selection of villages, blocks and subdivisions within the district.

Selection of blocks and villages

The district consists of two subdivisions: Khordha and Bhubaneswar. Initially, a comprehensive list of blocks within each subdivision was compiled. Two blocks were selected from each subdivision: Balianta and Balipatna from Bhubaneswar subdivision and Khordha and Tangi from Khordha subdivision. These blocks were chosen purposefully due to the distinct soil types and the diverse range of occupations performed by farmers compared to other blocks in the subdivisions. A complete list of villages within these selected blocks was then obtained, from which two villages were randomly selected per block, totaling eight villages across the four blocks. The map of district boundaries are well illustrated in Fig 2 in the following.

Selection of respondents

Farmers in the studied area were identified as respondents, defined as individuals or groups engaged in farming activities. A comprehensive list of all farmers in the sample area was compiled using data from block and district agricultural departments and verified by sources such as village heads and teachers. The sampling design is illustrated in Table 1.

The questionnaire was pretested on 10 per cent of the sample size and, although initially in English, it was explained to farmers in the local language (Odia) for clarity. Feedback from this testing phase helped refine the questionnaire before the final interview schedule was created. Data collection occurred through interviews in participants' homes and workplaces, fostering open and honest responses. This process spanned from July 2022 to May 2023, following an ex-post facto design.

Extent of occupational diversification

Simpson's index of diversification was applied for computation of the extent of occupational diversification of all the respondents in the sample in the line of the investigation conducted by Lakshman Reddy (2019) in Karnataka.

$$SID = 1 - \sum_{i=1}^{n} Pi^2, \text{ where } Pi = \frac{Xi}{\sum_{i=1}^{n} Xi}$$

Here:

'X_i'= 'i^{th}' activity.

'Pi'= Proportion of income from the i^{th} activity from the 'n' number of activities.

The range of values obtained for SID lies in between 0 and 1. The SID values are impacted by the tally of occupations (as income sources) along with the spread of income obtained among those number of occupations.

The income from all the sources of the respondent farmers and the distribution of the income was collected through the schedule. The proportion of income for each of the sources are calculated and used for calculation of Simpson index of livelihood diversification for all the farmers. Thus, after computing the diversification index scores, the interviewees were segregated into the extent of low, medium and high by applying half standard deviation method with the help of mean and standard deviation of the values of computed indices from each of the interviewee. This classification has been briefly explained by the following tabular illustration:

Category	Criteria
Low	Less than (Mean - ½ SD)
Medium	Between (Mean ± ½ SD)
High	More than (Mean + ½ SD)

Henry garrett's ranking technique

This procedure was employed to gauge the problems encountered by the farmer respondents by the orders of merit provided by them which were later transformed into rank by using a suitable formula. At first, the respondents were quizzed about the issues that have been the roadblocks for them towards occupational diversification and then these were enlisted under different dimensions named as 'Infrastructural', 'Promotional', 'Social', 'Economical' and 'Miscellaneous'. The respondents were instructed to rank these issues under each corresponding dimension as per their perception of seriousness of the issues that needs to corrected or mitigated and then these obtained ranks were later converted to score values by employing the formula stated (Garrett *et al*., 1969) as mentioned below:

$$\text{Per cent position} = \frac{100\ (R_{ij} - 0.5)}{N_j}$$

Where:

R_{ij} = Rank given for the i^{th} constraint by j^{th} respondent.

N_j= Number of constraints under each dimension.

Then the percent position was transformed to scores by the use of Garrett's table. For each constraint, the scores obtained were added and then total score value was divided by the number of respondents to obtain mean score value of that particular constraint. The ranking of the constraints under each dimension was conducted by assigning first to last rank to them in the decreasing order of the score values.

RESULTS AND DISCUSSION

Extent of occupational diversification of farmers

Table 2 illustrates that approximately half (47.50%) of farmers reported a moderate level of occupational diversification, while 30.42 per cent reported a high level. The remaining 22.08 per cent expressed low levels. Overall, the occupational diversification appears to be moderately to highly prevalent. This information from the study helps to yields about the considerable prevalence of diversification among the farm families in the contemporary era. These families engage in a multi-sectoral livelihood diversification strategy to achieve income stability and mitigate risk, irrespective of their socio-economic status in their society as it often incorporates both agricultural and non-agricultural activities. A significant proportion of surveyed households exhibited adult members engaging in diversified income generation practices. Over the past decade, the concept of sustainable livelihoods has gained traction as a critical element of sustainable development. However, in India, the agricultural livelihoods of small and marginal farmers are becoming unsustainable due to insufficient land productivity, hindering their ability to meet their family's food and livestock fodder needs. As a consequence, rural households are forced to explore alternative sources of income to ensure their survival (Lakshman Reddy, 2019).

But the result of majority reporting moderate levels of diversification and only a less portion of them expressing high levels, does imply to the point that there is still room for improvement in the scenario of their capability to diversify with the existing conditions. This can be effectively achieved by providing solution-oriented approach by the respective stakeholders of farming towards the roadblocks. Thus, by this notion, it is directed to upcoming sections which foretells about the constraints faced by the farmers while following occupational diversification. The findings of the study have been analogous to that the findings of Amurtiya *et al*. (2016); Yona and Mathewos (2017); Tizazu *et al*. (2018); Jackson and Anele (2018); Lakshman Reddy (2019) and Sharma (2020).

Constraints to diversification

Several formidable obstacles hinder the formulation of production strategies for livelihood diversification, differing among households and regions. Understanding these real-life constraints is crucial to addressing barriers to occupational diversification. These constraints have been categorized into distinct segments, detailed in the

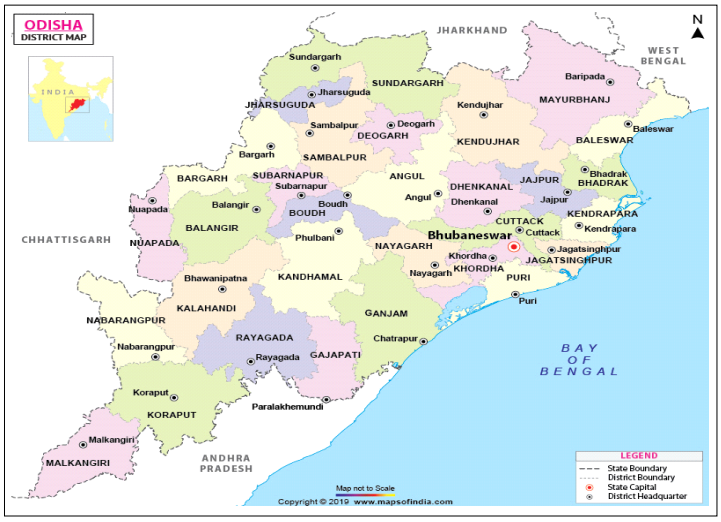


Fig 1: Political map of Odisha state with its districts.

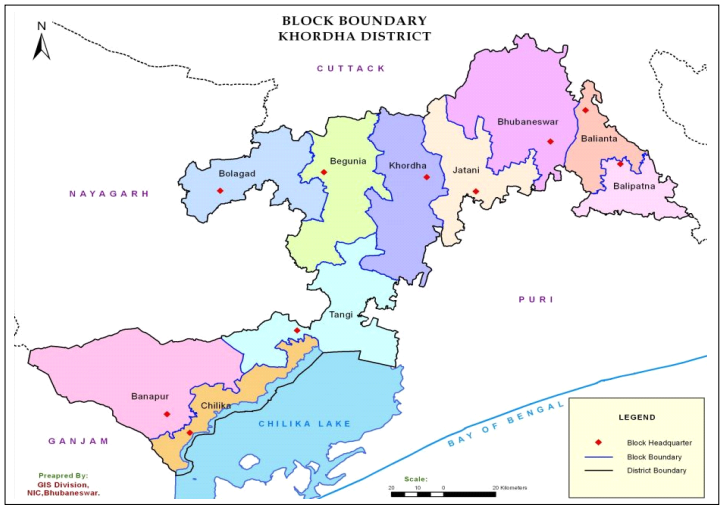


Fig 2: Depiction of block boundaries of the Khordha district.

Table 1: Selection of respondents from the sample.

District	Subdivision	Blocks	Villages	Respondents
Khordha	Khordha	Khordha	Atri	30
			Kumbharbasta	30
		Tangi	Badapari	30
			Sanrautapada	30
	Bhubaneswar	Balianta	Benupur	30
			Bainchua	30
		Balipatna	Srirampur	30
			Sarat	30

Table 2: Distribution of farmers according to their extent of occupational diversification.

Category	Criteria	Farmers	
		No.	%
Low	<0.29	53	22.08
Medium	0.29-0.63	114	47.50
High	>0.63	73	30.42

subsequent sub-sections, to provide comprehensive insight into the issue from multiple perspectives.

Infrastructural constraints

Every occupational endeavour relies on resources such as capital, manpower, facilities and services to effectively procure inputs, transform them into end products and make them available for consumption. Thus, infrastructure is

crucial and any neglect or deficiency can turn a profitable venture into a dismal entity. In that respect, the constraints as opinionated by the farmers under infrastructural dimension were enlisted and it was found that 'Lack of storage facilities' was ranked first with the highest mean score of 74.77 followed by 'Lack of marketing channels and facilities' (71.34) and 'Absence of custom hiring centres' (68.55) as the top three along with the rest issues as faced by the farmers to be classified under infrastructural domain (Table 3).

Due to the perishable nature of their products, farmers face challenges due to limited storage facilities, affecting product availability and potential returns. Lack of marketing routes further widens the gap between production and consumption, diminishing farmers' bargaining power in price negotiations. The absence of custom hiring centers exacerbates machinery access issues, particularly for farmers with limited finances and fragmented land holdings. Urgent attention and solutions are necessary to enable farmers to diversify their occupations effectively. These concerns need of great attention with prompt solution-oriented addressal in swift manner otherwise it would exhaust the favourable conditions for farmers to venture out to bring diversity in their pre-existing occupations even if they would be well prepared to do so.

Promotional constraints

The problems faced by the farmers for following occupational diversification under promotional component as opined that 'Lack of innovative technologies' ranks first (73.55) followed by 'Lack of market predictions and forecasting' (70.11) and 'Development programmes incompatible to farmer needs' (69.88) along with other issues in that manner of rankings (Table 4).

The absence of desired farm technologies has hindered farmers from exploring new on-farm occupations, despite their interest. Inadequate real-time market information complicates sales predictions, discouraging ventures even if profitable. While digital advancements have transformed non-agricultural sectors, the agricultural domain lags behind, limiting farmers' access to untapped markets. Addressing these issues along with others mentioned on priority basis would facilitate the adoption of more productive and profitable ventures, fostering a proactive rural environment conducive to resource utilization, skill enhancement and market-aligned production systems.

Social constraints

It is widely recognized that social factors significantly influence the occupational choices made by farmers. These factors are closely linked to rural cultural norms and practices. Given that farm households are deeply ingrained in societal obligations, any significant change may disrupt core values, leading to resistance and discontent, thus fostering rigidity towards such changes. Thus keeping in view of the above concern, in analyzing the constraints faced under social domain, it was found that 'Lack of proper education' as the top most with highest mean score of 72.23 followed by 'Less experience on new ventures'(70.79) and 'Less support from seniors and head of the household' (69.53) followed by the other issues so on with their respective rankings of their severity (Table 5).

Table 3: List of constraints as opined by farmers under infrastructural dimension.

Constraints	Mean score	Rank
Poor conditions of transport network	62.39	IV
Lack of marketing channels and facilities	71.34	II
Absence of custom hiring centres	68.55	III
Land-holding division due to inheritance	59.88	V
Lack of irrigation facilities	51.22	VI
Inadequate skilled labour force	35.66	VIII
Irregular supply and maintenance of electrical power	42.34	VII
Lack of storage facilities	74.77	I

Table 4: List of constraints as opined by farmers under promotional dimension.

Constraints	Mean score	Rank
Lack of market predictions and forecasting	70.11	II
Lack of contact from line departments, financial institutions, *etc*	32.66	VIII
Lack of innovative technologies	73.55	I
Low frequency of events like exhibitions, melas, field visits, *etc*	35.44	VII
Insufficient government incentives	49.22	V
Lack of skill-based training ventures	56.32	IV
Absence of e-commerce platform	69.88	III
Lack of publications like case studies, success stories, *etc.*	41.47	VI

The majority of farmers have limited education, with few having completed schooling and even fewer reaching college level. This lack of formal education restricts their exposure to new advancements, particularly in farming. Living in their native villages, farmers adhere to traditional farming practices passed down through generations which further limits their occupational exploration. Additionally, the prevalent joint family system, led by elderly members with traditional beliefs, offers minimal support for adopting new occupations, as they prioritize maintaining existing practices for sustainability. Social constraints, including societal expectations and norms, heavily influence farmers' decisions and livelihoods, highlighting the need to address these factors when considering occupational changes.

Economic constraints

The ultimate objective of any farmers is to ensure the everlasting sustenance of their household in the society for which they have to ensure profitable returns from their occupational venture. So, it depends on the effective management of resources for its transformation to valued produce which speaks of maintaining optimum trade-off between input and output in financial terms and thus disturbance in this balance can result to loss making venture and the concerned occupation to be left out by the farmers as their source of income. With this regard, the constraints under economic component as listed and ranked inferenced that 'Lack of own resources like assets, capital, manpower, *etc*' ranked first with maximum obtained mean score (69.93) followed by 'Rising prices of fuels (petrol and diesel)' (65.33) and 'Limited access to institutional sources of credit' (58.45) accompanied with other constraints as listed with the ranks associated to their prominence (Table 6).

The lack of sufficient capital and assets due to their modest financial and social backgrounds hinders farmers from investing in new occupational ventures. Increasing fuel prices, as tied to international crude oil rates, strain farm budgets by inflating expenses for machinery, irrigation and transportation to distant markets, discouraging changes to existing income sources. Limited access to institutional credit stems from issues such as awareness and understanding of loan schemes and their associated procedural complexities and interest payments. In this way, there are other constraints which needs of great attention in the order of their corresponding rank of preference as these could galvanize the farmers from the dimensions of economic prospective towards occupational diversification.

Miscellaneous constraints

There were other constraints which were also of great issues regarding their unfavorable impact on the farmers towards diversification of their occupations but could not find places in the above-mentioned components and thus listed under the category of 'Miscellaneous constraints'. This section concluded that 'Uneven distribution of rainfall' was opined to be top ranked problem with the score of 70.77 followed by 'Natural disasters like floods, cyclones, etc' (64.46) and 'Middlemen hegemony' (54.24) along with two others (Table 7).

In this region, monsoon rains traditionally fulfill the water needs for farming, making farming largely rainfed. However, global warming has disrupted the monsoon patterns and rainfall intensity, affecting crop cycles from

Table 5: List of constraints as opined by farmers under social dimension.

Constraints	Mean score	Rank
Predominance of opinion leadership	36.07	VII
Lack of proper education	72.23	I
Less support from seniors and head of the household	69.53	III
Lack of encouragement from neighbours and community	21.08	VIII
Family of poor background or crisis ridden	62.09	IV
Strict adherence to societal rules and customs	56.28	V
Shortage of successful entrepreneurs in the locality	45.03	VI
Less experience on new ventures	70.79	II

Table 6: List of constraints as opined by farmers under economic dimension.

Constraints	Mean score	Rank
High cost of farm machineries	50.66	IV
Inadequate income generation as than that of primary activity	35.11	VIII
Lack of own resources like assets, capital, manpower, *etc.*	69.93	I
Lack of insurance coverage	45.67	V
Incapability towards interest payment regularly	40.44	VI
Limited access to institutional sources of credit	58.45	III
Fluctuative nature of the market	39.32	VII
Rising prices of fuels (petrol and diesel)	65.33	II

Table 7: List of constraints as opined by farmers under miscellaneous dimension.

Constraints	Mean score	Rank
Middlemen hegemony	54.24	III
Natural disasters like floods, cyclones, *etc.*	64.46	II
Uneven distribution of rainfall	70.77	I
Price fluctuations due to unforeseen circumstances	43.60	IV
Seasonal pest and disease incidence	36.78	V

planting to harvesting. Uncertain cyclonic storms emerging in hot summers and cold winters have also damaged crops or delayed harvesting. Cartelization in farm produce marketing diminishes farmers' bargaining power, reducing their share of end consumer earnings. Addressing these constraints is crucial for fostering farmer positivity towards occupational diversification.

The findings of the investigation was found to be in the analogy with the results of the investigation conducted by various other authors (Jackson and Anele, 2018; Lakshman Reddy, 2019).

CONCLUSION

Initially, the study examines farmers' moderate levels of occupational diversification, indicating their enthusiasm for diversification but limited actualization, as evidenced by fewer farmers falling into the high extent category. This underscores the potential for improvement by identifying constraints. The investigation delves into various constraints faced by farmers in diversifying their occupations, categorized and ranked based on severity as perceived by respondents. A solution-oriented multidisciplinary approach is necessary to address these interconnected issues effectively. Insights from this study should inform policy formulation and implementation at the grassroots level. Conducted with optimism, the study aims to provide valuable input for stakeholders in rural sectors to enhance farmers' occupational diversification. Further research with diverse samples from various districts could offer a broader understanding of prevailing diversification levels and associated challenges.

Conflict of interest

We, the authors, have no competing or conflict of interests to declare upon in the article submitted.

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